



Name: _____ Date: _____

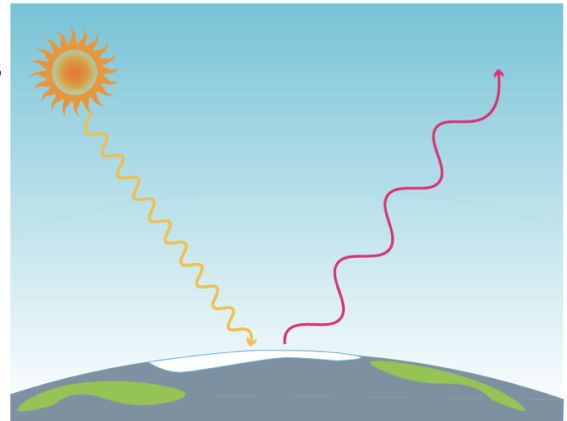
EARTH'S ENERGY BUDGET

Adapted and Modified By Shawn Walker

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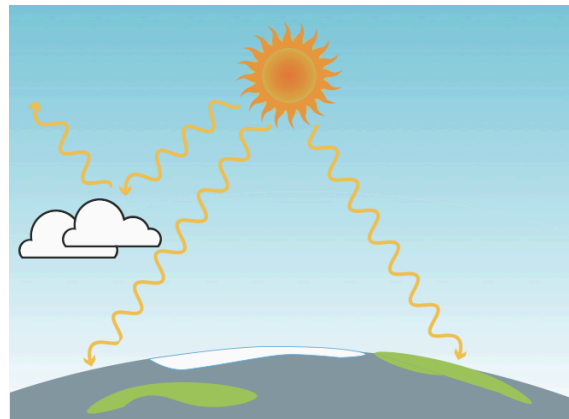
PART 1 - ENERGY BUDGET GUIDED NOTES

- The Earth's energy budget describes the _____ between the energy that is reaching the Earth from the Sun and the _____ that is flowing back out into space from the Earth.
- In the simplest sense, if this _____ stays balanced, Earth's temperature stays constant.



- Most of the energy on Earth comes from the _____.
- Energy travels in _____. Some waves are short. Some waves are long.
- Properties of energy are determined by the energies _____.
 - We can see things around us because of energy called visible light.
 - We can feel the heat from a campfire, which is infrared energy (heat).

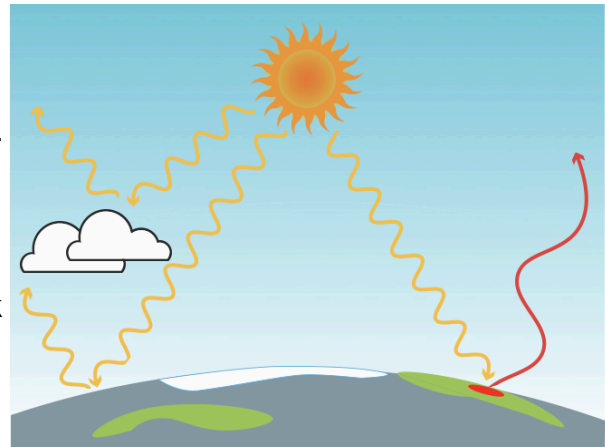
- The Sun emits _____ (ultraviolet energy and visible light energy)
- Some of the Sun's incoming shortwave energy is _____ off _____.
- Some of the Sun's incoming shortwave energy passes through Earth's atmosphere and reaches the Earth's surface.





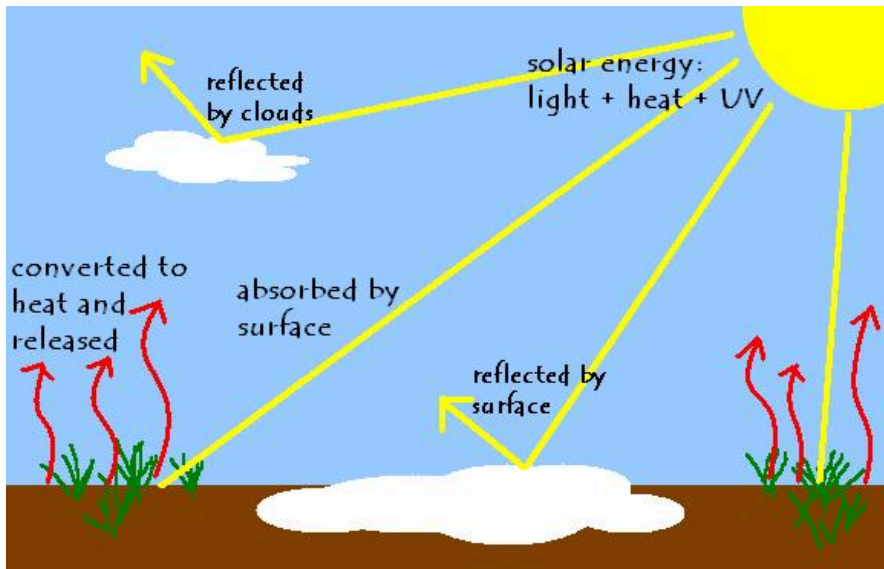
- The shortwave energy that passes through Earth's atmosphere is either _____ or _____ by the Earth's surface.
- Shortwave energy absorbed by Earth's surface causes the surface to _____!
- The Earth releases (emits) this heat back into the atmosphere as _____.

 - Longwave radiation = heat



PART 3 - ENERGY BUDGET QUESTIONS

Use the image below to answer the following questions:



1. What is the main **input** of Earth's energy?

2. What is the main **output** of energy from the Earth?



3. What might happen to Earth's energy budget (the balance of energy on Earth) if there were more clouds in the sky for a long period of time? Why?
Make sure to use the word **ALBEDO** in your answer.

4. Besides clouds, list 2 other naturally occurring objects/materials with high albedo that would reflect sunlight.

5. What might happen to Earth's energy budget if there were less surfaces on Earth's surface that have high albedo (such as less ice, leading to a lower albedo and higher absorption of sunlight on Earth's surface)?

6. What might happen to Earth's energy budget if there was more solar energy being **input** due to the Milankovitch cycles (when Earth's orbit, tilt, and wobble change)?

7. What would happen to Earth's climate if the amount of energy **input** was greater than the amount of energy **output**?

8. What would happen if the amount of energy **output** was greater than the amount of energy **input**?